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# IUE Archived Spectra

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# I. INTRODUCTION

The International Ultraviolet Explorer (IUE) was launched on January 26, 1978, from Cape Canaveral, Florida, with a design lifetime of some 3 years. It is still making continuous observations (following a brief commissioning period) after 10 years; it has been remarked that a large percentage of all astronomers on earth have made observations with the IUE. It has short-wave and long-wave cameras which record both low and high resolution UV spectra over an approximate wavelength range of 1150Å to 3200Å. For a detailed description of the operational and instrument characteristics of IUE, see Boggess *et al* (1978a and b).

There are about 64,537 extracted spectra in the IUE archive representing approximately 30 gigabytes of data on an IBM 3850 mass storage system attached to an IBM 3081 computer at the NASA Space and Earth Sciences Computing Center (NSESCC). The NSESCC is located at the Goddard Space Flight Center (GSFC) in Greenbelt, Maryland. There is also a tape archive in the NSESCC containing 300 volumes of processed data and 296 volumes of raw data.

The IBM 3850 is a device of honeycombed robot-retrievable 2.5-inch-wide tape cartridges; the robot brings the cartridge to a read station where the data is transferred to a staging disk. The Hierarchical Storage Manager (HSM) controls the direction of the robot and the location of files on the 3850. The entire operation is completed in less than one minute per request. A cartridge pair is treated logically as if it were an IBM 3330 disk with a 100-megabyte capacity. The total capacity of the IBM 3850 at the NSESCC is 220 gigabytes.

An integrated set of programs has been written to update the archive and facilitate user access to the data in the archive. The following sections describe in detail how to use the archive programs. Also described are the output products that each program produces. Section II describes the SPECTRA facility used to copy selected spectra from the archive to a user-specified output tape. Section III describes the IUEGWY facility. NSESCC has the Gateway system from Interlink installed on the IBM 3081. The Gateway allows the 3081 to appear as a DECnet node for file transfer and data management operations. The Gateway software and the GSFC Space and Earth Sciences Network (SESNET) have been used to transfer data directly from the NSESCC archive to selected VAX nodes on SESNET. Section IV describes IUEAS, which is the interactive facility used to plot and/or list selected spectra from the archive. IUEAS also has the capability to perform observation catalog data base searches. Section V summarizes the use of the various facilities to date.

# II. SPECTRA - COMMAND AND ORDER PROGRAMS

## Spectra Command Procedure

A command procedure is available on the NSESCC IBM 3081, using the MVS operating system and the interactive Time Sharing Option (TSO), which will submit a batch job to write an output tape of selected IUE spectra from the IUE archive. A batch job is required because MVS/TSO users are not allowed to allocate a tape drive interactively, so the command procedure cannot write to tape directly.

The command procedure is invoked by typing:

```
SPECTRA JOBID(SP1) TIMEST(001002) BOX(671) CLASS(A) +
MSGCLASS(X1) DEN(3) RECFM(U)
```

The items enclosed in parentheses are the default values. If the command line entered omits a parameter, the default value is used. For example, if you wished to have a run made with the JOBID changed to XXX, but other parameters unchanged, then it is sufficient to type the command as:

```
SPECTRA JOBID(XXX)
```

Following is a description of the parameters in the command line:

| Parameter | Description |
|---|---|
| JOBID(SP1) | Three characters used to form the eight-character IBM *jobname;* the first five characters are the IBM *userid* under which the TSO command is being executed. |
| TIMEST(001002) | This field is for estimating CPU and IO requirements for the IBM job. The first three digits represent the CPU estimate in minutes; the second three digits are the IO estimate in thousands of EXCPs (the IBM measure of IO activity).<br><br>If the CPU time estimate is less than 2 minutes but more than 1 minute, and the number of EXCPs will be between 2000 and 3000, then TIMEST(002003) is the minimun to request to avoid the IBM job timeout. It is permissible to overestimate the requirements, since it will only affect your selection to run; the job is charged only for the time it actually uses. |
| BOX(671) | This is the mailbox where the job printout is delivered; 671 is the Laboratory for Astronomy and Solar Physics mail stop located on the ground floor of Building 21. |
| CLASS(A) | This is the normal priority class for running jobs. N is the high priority class in which the charges are *doubled* over class A, but the job selection will be faster, so it may be preferred for high priority jobs. Classes E and F are run in the evening. The charge for class E is one half of that for class A, while the charge for class F (which could be delayed until the weekend) is one fourth. Standard overnight production runs should use class E or F. |
| MSGCLASS(X1) | This class refers to where the IBM job output is routed. The letters in parentheses denote a special queue where the output can be previewed from a TSO session (on a terminal screen) using the TSO OUTPUT command or the System Productivity Facility editor. It can then be routed to the printer or deleted.<br><br>X refers to the regular output, while 1 refers to the summary output. MSGCLASS(AA) will send all the output directly to the printer.<br><br>To look at, say, the summary output at your terminal, type the command<br><br>`OUTPUT jobname CLASS(1) PRINT(*)`<br><br>To have the output routed to the printer, type the command<br><br>`OUTPUT jobname NEWCLASS(A)`<br><br>If you would like to delete the output without printing, type<br><br>`DELETE  jobname PURGE` |
| DEN(3) | This parameter refers to the output tape density<br>2 = 800 b.p.i.<br>3 = 1600 b.p.i.<br>4 = 6250 b.p.i. |
| RECFM(U) | This parameter refers to the structure of the output file on tape where U denotes the IUE Guest Observer Format file structure. If the output data tape is to be processed on an IBM computer, and a more compact file structure is desired, then RECFM(VBS) is selected. |

After the SPECTRA command is typed, the procedure will issue the following prompt:

```
ENTER INPUT DATA SET NAME OR <CR>
```

If you have previously typed a dataset with the proper input for the SPECTRA order program, you should enter the fully qualified dataset name without quotes. If you press the carriage return <CR> with no dataset name, then the command procedure will prompt you to type the input data directly from the terminal. Entering a large data request directly from the terminal may not be desirable because an incorrectly typed line cannot be deleted. It may then become necessary to abort the job submission and start over.

It is important to read the following **Spectra Order Program** section before executing the SPECTRA command.

## Spectra Order Program

This program copies selected IUE spectra from the archives at the NASA Space and Earth Sciences Computing Center (NSESCC). It is most commonly used with NAMELIST input, the three forms of which are described in Table 1. The input requirements are described below. This program is designed to be run with the SPECTRA command procedure described in the preceeding section, which should be read before attempting to make computer runs.

When SPECTRA is run, you can point to the edited input file or type the input directly. When typing a NAMELIST input line, the IBM Fortran rules for input must be used: the &NAME field must begin in position 2 of the input line and the &END field must end before position 73.

The first input line, required of all SPECTRA runs, is the &OUT line shown as the first line in Table 1. The variables that may appear on the line are described below.

| Variable | Description |
|---|---|
| **OTAPE** | This is the volume name for the output tape; it is six or fewer characters in length, and registered in the NSESCC Tape Library System (TLS). |
| **SF** | An integer value (default SF = 1) specifying which file on the tape is to receive the output data. |
| **TYPE** | This specifies the type of input to follow.<br>RDAF — Special input from the Regional Data Analysis Facility; further input is written on OTAPE.<br>NSSDC — Data is in the Camera/Sequence number format. This is the TYPE that most requesters will use.<br>COPY — Specifies that input will be specified as either archive Mass Store partition/member numbers, or as archive tape/file numbers. |
| **REQID** | This field (eight characters maximum) identifies the requester; it is usually the requester's last name, and should be specified consistently from run to run. |
| **MASTIN** | Specifies whether input should come from the Mass Store or from tape. The default is 1 for the Mass Store and generally should not be changed. The value 0 indicates the data should be read from the archive tape, and this option would be selected if the Mass Store contains the wrong data or the Mass Store was not available. |
| **DTYPE** | The options are PROC for processed data or RAW for raw data files. The raw data files have had essentially no processing performed on the data, and are of little value unless you have specialized software; even then only a limited number of files should be requested with the Order Program. Requests for a large number of raw files should be made to the IUE Project Office. |

The following input lines will depend on the processing TYPE specified in the &OUT line. If NSSDC was selected, then the following input lines will all be of the &NSSDC type. The one variable defined on this line is--

| Variable | Description |
|---|---|
| CS | The values are character strings like 'LWP2345'. There can be a maximum of ten camera/sequence number pairs on an input line. |

The number of &NSSDC lines that can follow an &OUT line is limited only by the CPU time, the IO time, and the capacity of the output tape.

Occasionally the catalogs may have a wrong pointer to the archive data, but through judicious research the Mass Store partition/member numbers or the tape/file numbers have been determined. At this point the Order Program should just copy what is at the specified location instead of terminating the request because the file is not consistent with the catalog. The specification of TYPE='COPY', and either MASTIN as 0 for tape input or 1 for Mass Store input would have the desired result.

For COPY runs the remaining lines are &IN type where the variables are--

| Variable | Description |
|---|---|
| ITAPE | String of up to six characters specifying the input volume name. |
| NF | Integer (maximum value 10) indicating the number of files to be copied. |
| FILES | NF integers indicating the files to be copied. |
| IPN | The Mass Store partition number. |
| IMN | The member number in the partition to be copied. |

Note that the Tape/File vs. the IPN/IMN combinations are mutually exclusive.

The standard output from running the Order Program is very detailed as to the request, header files and error messages when things go wrong. However, it is also useful to see a summary of the order processing to ascertain if all the requests were filled and, if not, which ones failed. The program prints a summary file of useful information, and Table 2 contains a description of the fields in this output file.

Included in the summary output is a field where an error return code is placed if problems are encountered. A list of the possible return codes with a brief explanation of each is in Appendix A.

# III. IUEGWY - GATEWAY ACCESS TO THE ARCHIVE

IUEGWY refers to the software that has been developed to copy IUE spectra from the IBM 3081 IUE archive to nodes on the Space and Earth Sciences local area network SESNET. Processed data is retrieved from the IBM Mass Storage System, and raw data is retrieved from a tape archive. The data are copied to a specified node on the network and into the requester's primary directory. Only one cam/seq is allowed per request, but all the data types in the archive for the cam/seq request may be obtained. If the requested spectra is not available, or an inconsistency is found in the request, a message file is sent to the user's directory.

To initiate a request, the command procedure called IUEGWY is invoked on one of the SESNET VAX nodes. This command procedure sends a batch job, to be run on the IBM 3081. Upon successful completion of the batch job the user should find the requested data in the standard RDAF (Regional Data Analysis Facility) ___.LAB and ___.DAT files. (See Appendix B for format options.)

The first character of the filename is L if a long wavelength camera is used, and S for a short wavelength camera. The next 4 or 5 characters are the image sequence number. The last character is either H,L,P,R, or S, depending on the number of lines in the spectra and the number of bytes

per line. For example, the name of the LWP 2345 header file would be L2345L.LAB. Details about the last character selection in the file name can be obtained from the RDAF, if required.

The command procedure is invoked by typing:

```
@CHAMP$USER1:[HUGHES]IUEGWY username password node cam seq
type jobname sponsor
```

Following is an explanation of the command procedure arguments:

| Argument | Description |
|---|---|
| **username** | User's name on node that is to receive the data. |
| **password** | User's password up to 8 characters on the receiving node; required to write data into the requester's directory. |
| **node** | Name of the network node that is to receive the data. |
| **cam** | Camera number of the desired spectrum (1 = LWP; 2 = LWR; 3 = SWP). |
| **seq** | Sequence number of the desired spectrum. |
| **type** | Data type required:<br>MEHI merged extracted high dispersion.<br>MELO merged extracted low dispersion.<br>ELBL extended line by line.<br>RAW raw data.<br>ALLP all processed data; either MEHI or MELO and ELBL.<br>ALL both processed and raw data. |
| **jobname** | IBM 8-character jobname consisting of an IBM 5-character userid combined with a 3-character jobid which identifies the IBM batch job that is submitted. If you do not have a valid userid on the IBM 3081, type a <CR> (carriage return), and the command procedure will use a default userid. |
| **sponsor** | IBM 5-character account number. |

If the command procedure is invoked with no arguments, then the requester will be prompted for the information. In the case where the requester does not have a valid IBM userid and sponsor number, the command procedure will use a default userid and sponsor number and notify the requester of the batch jobname that was created. In some cases it may be useful to know the batch jobname. Sometimes the IBM job may stay in the queue longer than usual, or the tape mount is delayed, or the job failed in an unusual way. All the requester knows is that the desired data has not arrived in his directory. It is possible to inquire about the status of an IBM job using the JES command. Just type the word JES on CHAMP, IUE, HRS, or UIT and a menu of self-explanatory options should be printed on the screen.

The options of primary interest are--

SHOW jobname

to show the status of the submitted batch job, and

FETCH jobname

to fetch the job output from the IBM output queue into a file in your directory with the jobname.LOG name.

Whenever a 'JES SHOW' or 'JES FETCH' command is issued, a NETSERVER.LOG file is placed in your directory. It is wise to delete these files unless the output indicates a network error.

It takes 1,157 blocks of VAX VMS disk space to hold a raw data file. Some limited testing has produced cases where network transmission errors have resulted in only part of the file being

transferred with no warning message to the user unless he reads the IBM batch job output. If your raw data file (the ___.DAT file) does not use 1,157 blocks, it will be necessary to request it again.

Another word of caution for requesters who have their own userids and sponsor numbers. It is important to use a unique jobid for requests that have a probability of running on the IBM computer at the same time, because several temporary files are created on the IBM computer which use the jobid specification in the name. If one job has allocated a file with the same name that the second job is trying to use, the second job will most likely terminate unsuccessfully. If the default userid and sponsor is used, the command procedure will automatically assign a unique jobid.

Any error messages associated with a specific request will be put into your directory with the jobid.ERR name.

# IV. IUEAS - INTERACTIVE ACCESS TO THE ARCHIVE

If you have access to a graphics terminal and a telephone modem, any of the releasable spectra in the IUE archives can be displayed on your terminal. Display options include plots, data listings, and catalog information from the IUE Merged Observer Log for the selected camera and image number. It is also possible to perform data-base searches for spectra satisfying specific criteria. This access system permits a quick-look evaluation of the available IUE data and enables the user to decide which spectra to obtain for detailed analysis. A public account has been established to permit access to this archive over standard telephone lines. The details of how to connect your terminal to the archival system are in Appendix C.

Since reference to spectra is by camera and sequence number, it may be necessary to consult the IUE Merged Observer Log that is distributed annually on microfiche with the IUE proposal instruction package before starting a session.

## Data Processing

(a) Low Dispersion

The plots of the complete absolute flux distribution are from 1150Å to 1970Å for SWP and from 1900Å to 3200Å for the long wavelength cameras. Listings on your screen of the absolute flux can be produced for user-specified wavelength intervals. As shown in Figure (1A) and Figure (1B), the low-dispersion plots also display the gross and smoothed background spectrum to help in evaluating the photometric quality of the data. For low dispersion, the absolute calibration is as specified by Bohlin (1986) for SWP and LWR. For LWP(ITF1), the calibration of Cassatella and Harris (1983) is used. Future improvements to low-dispersion calibrations will be included as available.

The following special processing applies to the low-dispersion spectra:

1. The spectrum is extracted from the line-by-line file (Turnrose and Thompson, 1984) for all image numbers before 13464 for SWP and 10124 for LWR, unless the data have been reprocessed with the new software in use since 1980 at GSFC and 1981 at Vilspa.

2. The wavelength correction of Harvel, Turnrose, and Bohlin (1979) is made for SWP and LWR image numbers less than 6023, unless these data have been reprocessed. The mean small aperature dispersion constants of Turnrose, Bohlin, and Harvel (1979) with the displacements for the large aperture from Turnrose *et al.* (1979) are used for the wavelength assignments.

3. The correction algorithm that was adopted by the three IUE agencies is applied to remedy the error in the intensity transfer function for the SWP camera (Holm *et al.* ,1982) for those images taken in the first year of operations that still have not been reprocessed for the archive.

4. The Lyman-alpha region and the 2200Å bright spot are excluded for the automatic scaling of the plots.

(b) High Dispersion

The ripple corrected data are displayed for any wavelength interval that is an integral number of Angstroms. The production processing ripple correction currently in use is applied to the net spectrum as it was extracted by the original production processing. Two examples of high- dispersion plots are shown in Figure (2A) and Figure (2B).

(c) Caution and Warnings

Since some errors exist in the processing and cataloging of the thousands of IUE spectra, the user should critically evaluate the data recalled from the archive. The system described here is intended primarily for quick-look evaluations. For a more thorough examinaton, the complete data set can be obtained directly (Heap, 1986) for analysis at a home institution or at a Regional Data Analysis Facility.

Some common pitfalls are--

1. Some exposure times are imprecise in the current IUE Merged Observer Log, especially in the case of short exposures, where the high voltage rise time of 0.12 s or the timing interval of 0.4096 s is important. Many times have been reduced by one second due to computer truncations errors. Trailed exposure times do not have the true slit length taken into account. The exposure time used to compute absolute fluxes in low dispersion is listed at the top of the plot, so that the true exposure time can be used to correct the displayed fluxes.

2. Since the small IUE apertures do not transmit a constant fraction of the light from a point source, the true level of the stellar flux cannot be precisely determined from a small-aperture spectrum. A warning message will appear on small-aperture plots for low dispersion. A rough estimate of the absolute flux can be obtained by doubling the fluxes shown, although the transmission can vary over the range of 0.25 to 0.75.

3. Fluxes for diffuse sources are the total transmitted by the aperture. To get surface brightness, the user must divide by the area of the aperture used to make an observation (Panek, 1982).

## Review of IUEAS Menus

After you have successfully logged onto the NSESCC 3081 and have started the IUEAS procedure, the top menu in Table 3 will appear. Five options are available, and data for the three cameras are listed with currently specifiable sequence numbers. The archive is constantly being upgraded and the sequence number ranges change at least monthly. The catalog referenced in the option column is an abbreviated diskfile of the Merged Observer Log. If option 4 is selected, a camera number or sequence number need not be entered, but commas should be typed to note the absence of these items, *e.g.*, ",,4" to specify a search of the catalog.

All plots are made by TEMPLATE, a comprehensive graphics package from Megatek Corp. The IUEAS will display the bottom menu in Table 3 showing the types of graphics terminals now included in the IUEAS program. The menu shows that the usual IBM, DEC, and Tektronix terminals are supported; there are other drivers available from TEMPLATE for Hewlett-Packard and other type terminals for which no support has been requested. For questions about future terminal support, please contact Dr. Carol Grady in the RDAF at 301-286-3938.

Figures 1 and 2 are typical examples of high- and low-dispersion plots as they will appear on the screen.

If the list option is selected, you will then be offered several subsequent options once the data is retrieved. A wavelength subinterval can be selected for printing, or the entire data file can be printed, either continuously or with periodic prompts to continue. The wavelengths and spectral values are printed four per line so that the listing of an entire low-dispersion file should not take more than a dozen screens.

The menus available when the search catalog option is selected are shown in Table 4. The top menu is the first one displayed and allows you to define/modify search criteria, execute a search,

and finally print the results of a catalog search. If the define/modify search criteria is selected, then the bottom panel shown in Table 4 will appear. The fields and their specifications are fairly well described and displayed for review before searches are actually performed. Most searches will be completed within 10 seconds. If you wish to restore previously selected criteria to their null values, then the IBM 'end of data designator' /* should be typed when more input is requested. It is also possible to specify several search criteria at once. Typing 1 3 4 8 in response to "enter criteria numbers" will result in requests for input for the four fields sequentially, without printing the selection criteria menu between each input. The usefulness of this feature will become apparent after several searches have been worked through at the terminal.

# V. SUMMARY

The archive programs discussed in the preceeding sections have been developed at various stages over the last few years; the staged development was dependent primarily on the introduction of the necessary hardware and software tools into our computer environment. The first capability, the SPECTRA order and command program, was made available for general use in May, 1982.

The plot in Figure 3 shows the number of spectral images (a spectral image can represent 1-4 tape files) retrieved per month and the cumulative number of images retrieved. The SPECTRA programs have been heavily used by the NSSDC and RDAF staff to satisfy most of the data requests made by IUE astronomers worldwide. The average number of 744 images retrieved per month and a total of over 49,000 images retrieved from April 1982 to November 1987 confirm this heavy usage.

Table 5 shows the IUEAS and IUEGWY usage for the several months that they have been available. The IUEGWY requests have averaged 236 per month. The plot feature of IUEAS, the most useful feature of the program, has an average of 33 per month, or about a seventh of the IUEGWY use. The archive information feature of the IUEAS program is used primarily by the RDAF and NSSDC staff members in filling requests and checking on the availability of the data in the archive.

There are probably several reasons to explain the relatively small usage of the IUEAS program compared with the SPECTRA and IUEGWY spectra-delivery programs. If you are a local user, there are more sophisticated programs to analyze IUE spectra at the RDAF. Remote users find that calling the Goddard Rolm telephone system is difficult. Since it is impossible to provide support for all the modems, graphics terminals, and personal computers in use, frustration results in finding a workable hardware combination. Also, if users are not in the greater Washington, D.C., area the telephone charges may be excessive. On the optimistic side, the IUEAS program has been available nationwide for only a few months, so its long term use is not yet known. Many of the problems of using IUEAS are being addressed, and the program can provide instant access to ten years of highly valuable IUE observations.

## Acknowledgement

The IUE archive and associated programs have been worked on over the years by a number of people. It is with great pleasure that the authors acknowledge the invaluable contributions made by Elva Glover, Karen Levay, and Clarence Wade. In addition, the constant support and encouragement provided by Jaylee Mead, Mike Hollis, and Fred Shaffer have kept the project moving forward.

TABLE 1-INPUT DATA LINES FOR SPECTRA ORDER PROGRAM

```
&OUT OTAPE= 'c',  SF= n,  TYPE= 'RDAF',  REQID= 'xxxxxxxx',  MASTIN= 1,  DTYPE= 'PROC'    &END
                            'NSSDC'                           0           'RAW'
                            'COPY'

&NSSDC  CS= 'c', 'c', ..., 'c'   &END

&IN   TAPE= 'c',    NF= n,    FILES= n,n,...,n    &END

&IN   IPN= n,     IMN= n    &END
```

c - One or more alphanumeric values
n - Integer value indicates default where none provided

For the &IN input the maximum number of files that can be specified on one line is 10.
For &NSSDC input 'c' is a Camera/Sequence character string like 'LWP2345' with a maximum of 10 allowed on one line.

TABLE 2-DESCRIPTION OF THE SPECTRA ORDER PROGRAM SUMMARY OUTPUT

SPECTRA ORDER PROCESSING SUMMARY

```
DATE: MM/DD/YY  TIME: HHMM  PID: CCCC  REQID: CCCCCCCC

 R# CAM SEQ  RC REQ REL CPY CF SOURCE(P) SOURCE(R)  OTPE  OFLE

  n  n nnnnn nn ccc  c   c  nn cccc cccc cccc nnnn cccccc nnnn
```

| Name | Description. |
|---|---|
| R | -sequential request number. |
| RC | -return code from execution of the order program (normally 0). |
| REQ | -data request type: PRC processed data, RAW raw data, CPY indeterminable data type. |
| REL | -Y/N, depending on whether the data is releasable. |
| CPY | -Y/N, depending on whether the data was written on output tape. |
| CF | -C denotes current file index, F denotes total number of files for current CAM/SEQ. |
| SOURCE | -Source of the data: (P) processed, (R) raw. |

Table 3a-IUEAS MAIN MENU

IUEAS ARCHIVE SPECTRA

| NUMBER | CAMERA | SEQUENCE NUMBER MIN | MAX | NUMBER | OPTION |
|---|---|---|---|---|---|
| 1 | LWP | 1022 | 12283 | 0 | EXIT |
| 2 | LWR | 1024 | 18155 | 1 | PLOT SPECTRA |
| 3 | SWP | 1036 | 32527 | 2 | LIST SPECTRA |
| | | | | 3 | LIST CATALOG INFO |
| | | | | 4 | SEARCH CATALOG |

ENTER CAMERA NUMBER, SEQUENCE NUMBER, OPTION NUMBER -

---

Table 3b-GRAPHICS TERMINAL SELECTION MENU

LIST OF TERMINALS ON WHICH SPECTRA MAY BE PLOTTED

| TERMINAL NAME | DESCRIPTION |
|---|---|
| DGG | VT125, VT240, VT241, DEC, GIGI |
| GD4 | IBM 3279 TYPE TERMINALS - |
| TEK | TEKTRONIX 4010 |
| TK1 | TEKTRONIX 4100 |
| TK4 | TEKTRONIX 4014, 4015 |
| TK7 | TEKTRONIX 4025, 4027 |
| VT6 | VT640,(RETRO-GRAPHICS VT100) |
| RET | ---- RETURN TO MAIN MENU ---- |

ENTER TERMINAL NAME -

Table 4a-IUEAS SEARCH MAIN MENU

IUEAS CATALOG SEARCH

| OPTION NO. | - | OPTION |
|---|---|---|
| 1 | - | DEFINE SEARCH CRITERIA |
| 2 | - | MODIFY/LIST SEARCH CRITERIA |
| 3 | - | EXECUTE SEARCH |
| 4 | - | LIST RECORDS FOUND |
| 5 | - | EXIT SEARCH |

ENTER OPTION NO -

---

Table 4b-IUEAS SEARCH CRITERIA MENU

| CRITERIA NO. | - | SEARCH CRITERIA | - | |
|---|---|---|---|---|
| 1 | - | PROGRAM ID | - | XXXXX |
| 2 | - | OBJECT CLASS | - | XX, XX, XX, XX |
| 3 | - | OBJECT ID | - | XXXXXXXX |
| 4 | - | DISPERSION | - | X |
| 5 | - | APERTURE | - | X |
| 6 | - | SPECTRAL TYPE | - | XXXX |
| 7 | - | RA(MIN,MAX) | - | XX XX XX.X, XX XX XX.X |
| 8 | - | DEC(MIN,MAX) | - | XX XX XX.X, XX XX XX.X |
| 9 | - | DATE(MIN,MAX) | - | MM/DD/YY, MM/DD/YY |
| A | - | END SELECTION | | |

ENTER CRITERIA NO(S) -

Table 5-SUMMARY OF IUEGWY AND IUEAS USAGE

| | IUEGWY REQUESTS | IUEAS REQUESTS | | | |
|---|---|---|---|---|---|
| DATE | SPECTRA | PLOT | LIST | INFO | SEARCH |
| 04/87 | 44 | | | | |
| 05/87 | 98 | | | | |
| 06/87 | 115 | 10 | 9 | 69 | 0 |
| 07/87 | 112 | 23 | 48 | 690 | 3 |
| 08/87 | 177 | 24 | 32 | 37 | 0 |
| 09/87 | 195 | 13 | 32 | 103 | 0 |
| 10/87 | 278 | 15 | 56 | 44 | 10 |
| 11/87 | 243 | 89 | 61 | 229 | 14 |
| 12/87 | 139 | 12 | 24 | 58 | 3 |
| 01/88 | 282 | 61 | 2 | 19 | 6 |
| 02/88 | 204 | 30 | 110 | 9 | 5 |
| 03/88 | 420 | 41 | 31 | 31 | 5 |
| 04/88 | 527 | 63 | 14 | 148 | 14 |
| 05/88 | 481 | 16 | 6 | 24 | 10 |

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# APPENDIX A. PROGRAM ERROR CODES

| Error | Explanation |
|---|---|
| 01 | Camera/sequence number is not in archive. |
| 02 | Error searching the index file for record numbers has been made. |
| 03 | Spectrum is not releasable. |
| 04 | Spectrum is not on Mass Store. |
| 05 | High-dispersion processing error. |
| 06 | Calibration is not possible on data this old. |
| 07 | Spectrum read is not spectrum requested. |
| 08 | Tape/file on request is not consistent with catalog. |
| 09 | Camera/sequence number is invalid. |
| 10 | Catalog refers to nonexistent archive tape. |
| 11 | RDAF request block on tape has invalid structure. |
| 12 | Raw Image Archives tape/file information is not available. |
| 13 | Spectrum is not in archive. |
| 14 | Error allocating node message file has been made. |
| 16 | Premature EOF (End of File) processing spectrum header. |
| 17 | Premature EOF reading RIA data. |
| 19 | Unauthorized request for RIA data. |
| 20 | Mass Store allocation problem. |
| 21 | Invalid file specification for search record file. |
| 23 | Maximum allowable data sets in use. |
| 26 | Terminator record missing from statistics file. |
| 28 | Statistics file unavailable. |
| 29 | Error reading archive data file. |

# APPENDIX B. SPECIAL FORMAT OPTIONS

When data is transferred using IUEGWY, the default format is the IUE Regional Data Analysis Facility (RDAF) disk format.

The RDAF format is a modification of the IUE GO (guest observer) format that facilitates processing the data with standard RDAF operational programs. To obtain the data in the GO format, append :GOF to the data type requested in the command procedure. For example, to request all processed data in GO format, type ALLP:GOF.

You will still have a LAB and DAT file rather than one file, but the data is the same as it appears on the GO tape. To reconstruct the LAB and DAT files on disk to one GO file on tape, use the following VMS commands:

```
$MOUNT/FOR/BLOCK=2048 tape_unit:
$APPEND file.LAB,file.DAT tape_unit:
```

If several files are to be skipped on the tape before more data is added, the command

```
$SET MAGTAPE/SKIP=FILES:n tape_unit:
```

will skip n files from the current position of the tape.

# APPENDIX C. LOGGING ON TO THE IUE ARCHIVE SYSTEM

To use the IUEAS interactive archive system, set your terminal to flow control off and local echo on. The telephone number depends upon baud rate and parity of your terminal as follows:

| BAUD | EVEN PARITY TERMINAL NUMBER | NO PARITY TERMINAL NUMBER |
|---|---|---|
| AUTO | 301-286-9500 | 301-286-9000 |

The system can autodetect 300, 1200, and 2400 baud rates.

For telephone problems, contact the NSESCC Technical Assistance Group at 301-286-9120 or -9450. For other questions, ask Dr. Carol Grady in the RDAF at 301-286-3938. Sometimes a wait at the end of the phone number is required, such as % % % in the case of the VAXNET autodialing software.

When the system answers, press the carriage return and the following line will appear on your screen:

```
ENTER NUMBER:
```

You should reply:

```
scfl
```

After the CALL COMPLETE message appears, hit another carriage return or two. You should then receive the message:

```
INVALID-SW-CHARS
```

You should enter the following line in response:

```
btso
```

The system will respond with the line:

```
READY-TO-IBM
```

Next enter:

```
logon iueas/gsfc
```

The system will log you into the archive system and prompt you for required information. First-time users are required to go through a registration procedure so that the usage of the data can be recorded for statistical tabulations. Subsequent logons require only the entering of your computer id and password that are assigned during the initial session.

To exit from the IUEAS procedure and log off, enter three zeros in response to the query for a camera, image number, and option.

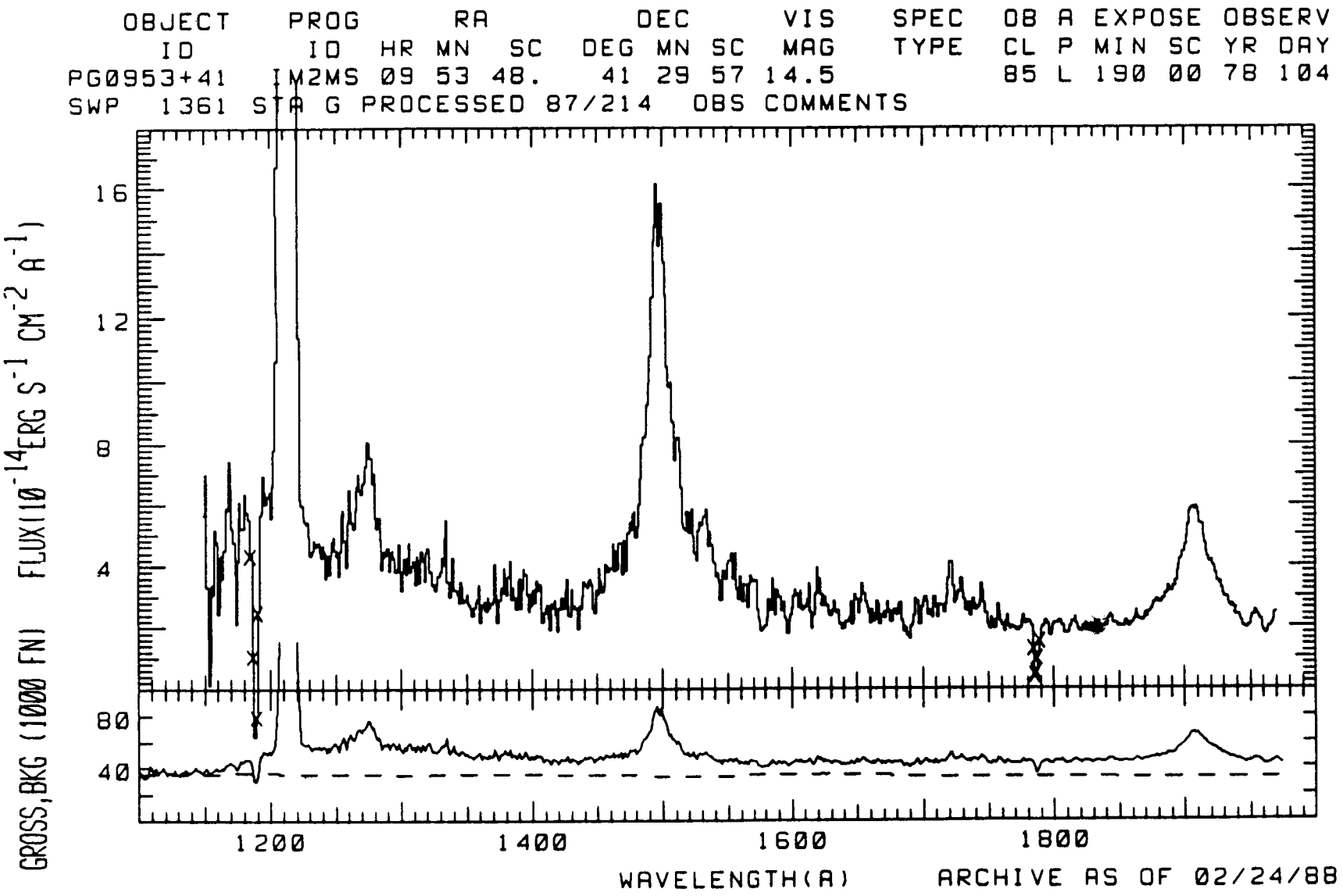


Figure 1A. Sample low-dispersion plot. The flux in absolute units occupies the main body of the plot, while the gross (solid line) and smoothed background (dashed line) appear in the lower panel in units of 1,000 flux numbers (FN). The FN-unit is the linearized measure of the IUE signal.

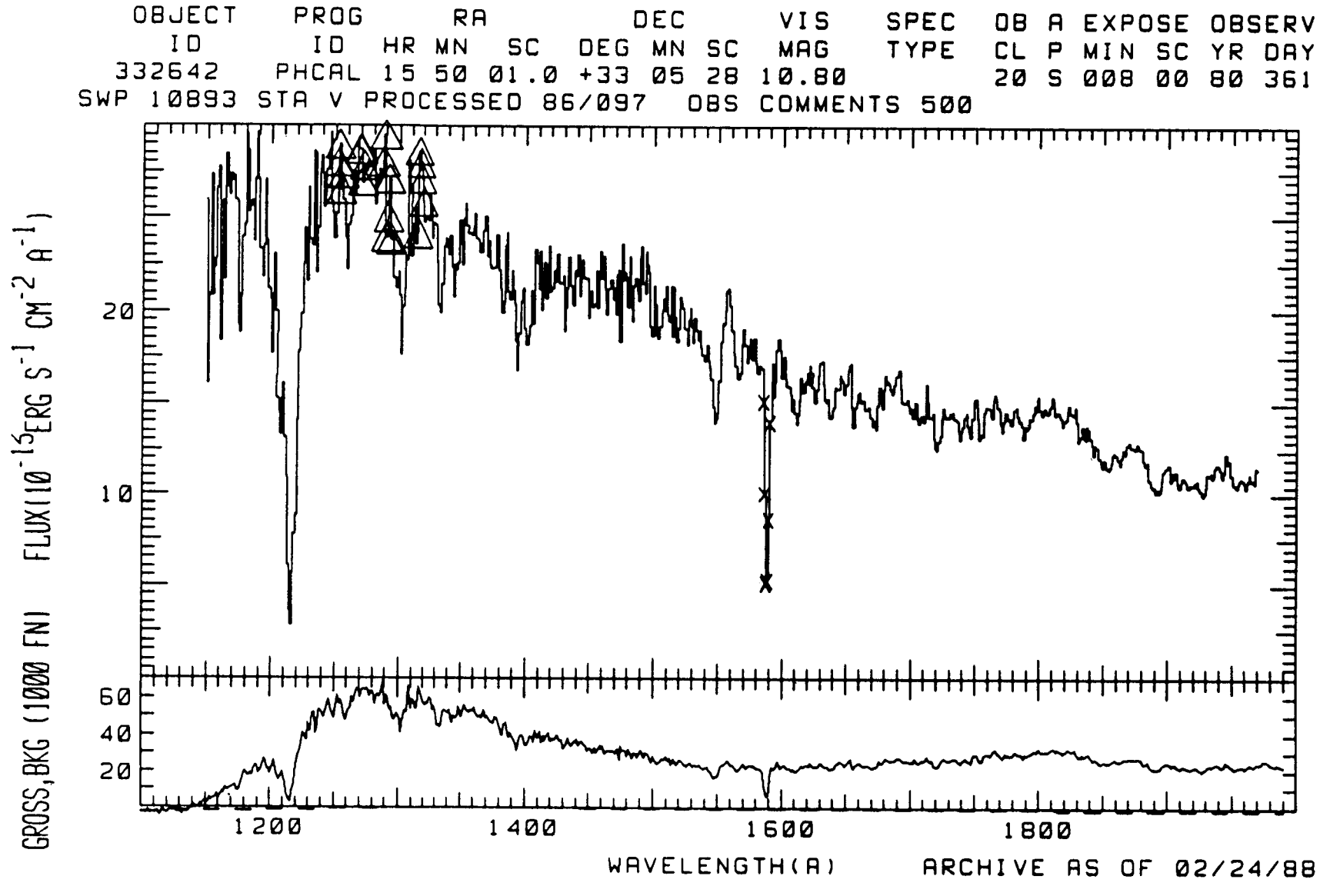


Figure 1B. Sample low-dispersion plot. Notice that the smoothed background is outside the plot boundary. A feature of the plotting software allows data to be plotted by 5% off scale. Reseaus are marked with an 'X', and extrapolated ITF values are marked with a triangle.

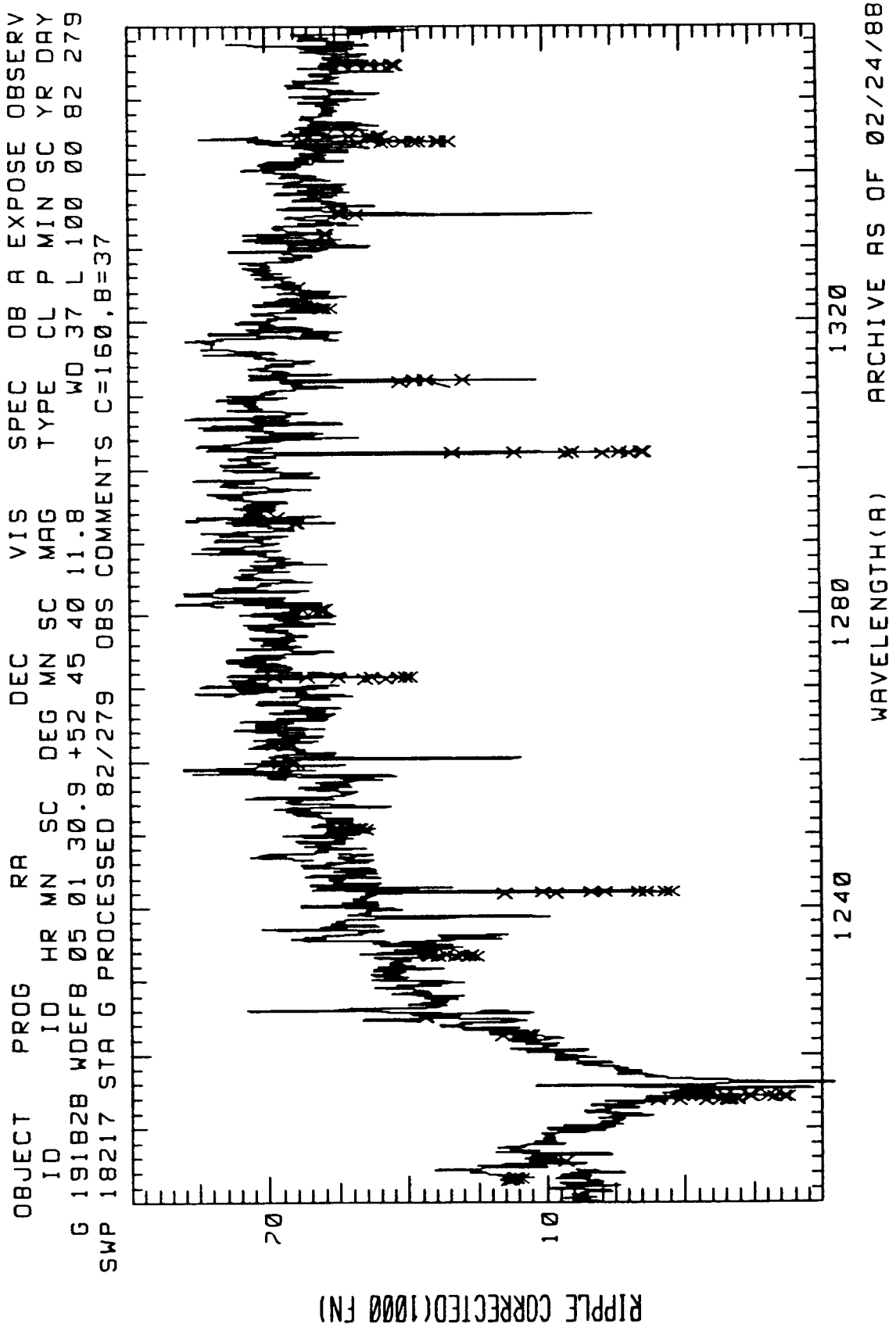


Figure 2A. Sample high-dispersion plot. The catalog information at the top of the plot is from the IUE Merged Observing Log. The flux is plotted in units of 1,000 flux numbers (FN).

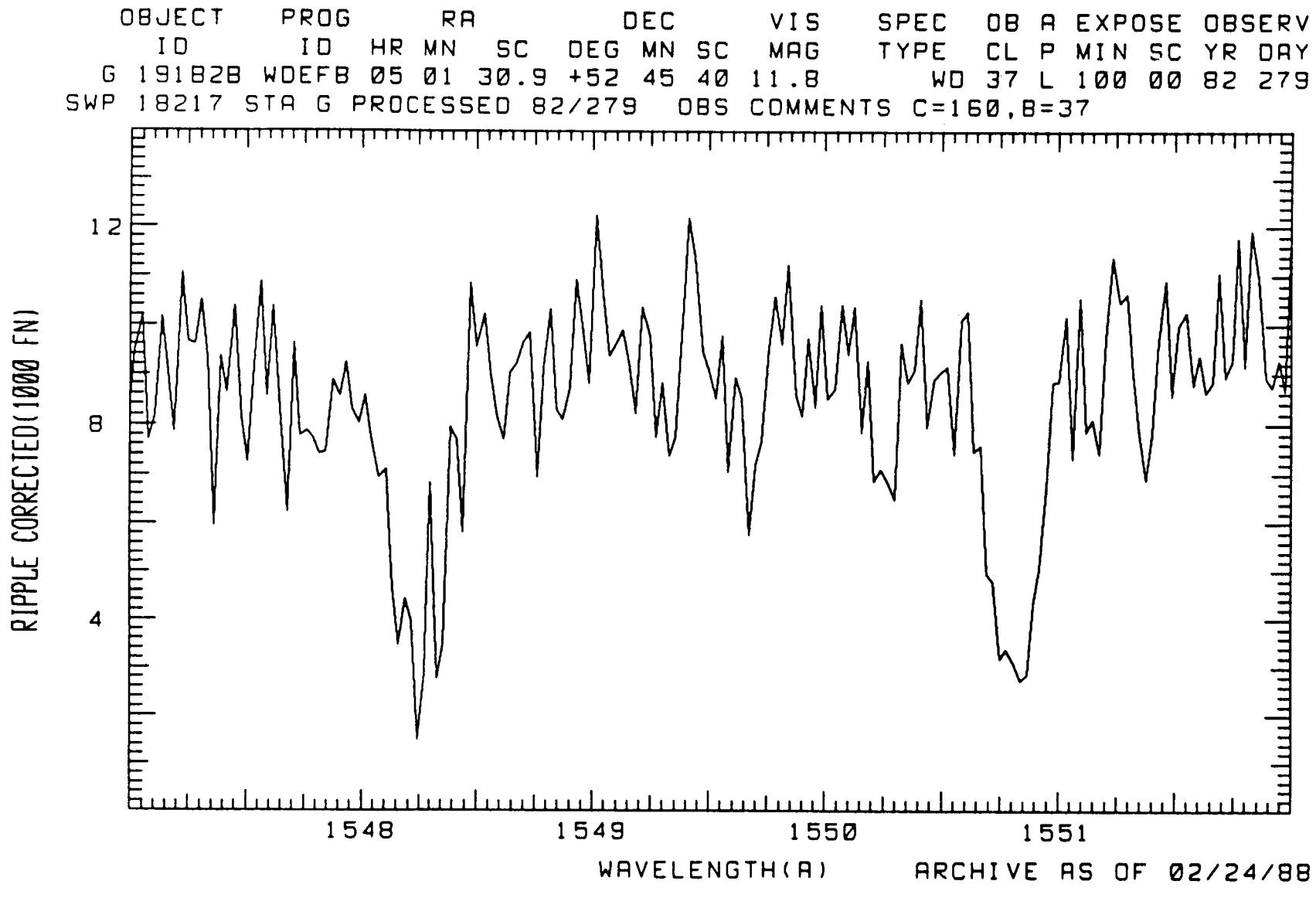


Figure 2B. Sample high-dispersion plot. The data comes from the same CAMERA SEQUENCE NUMBER as Figure 2A with a different wavelength range selected.

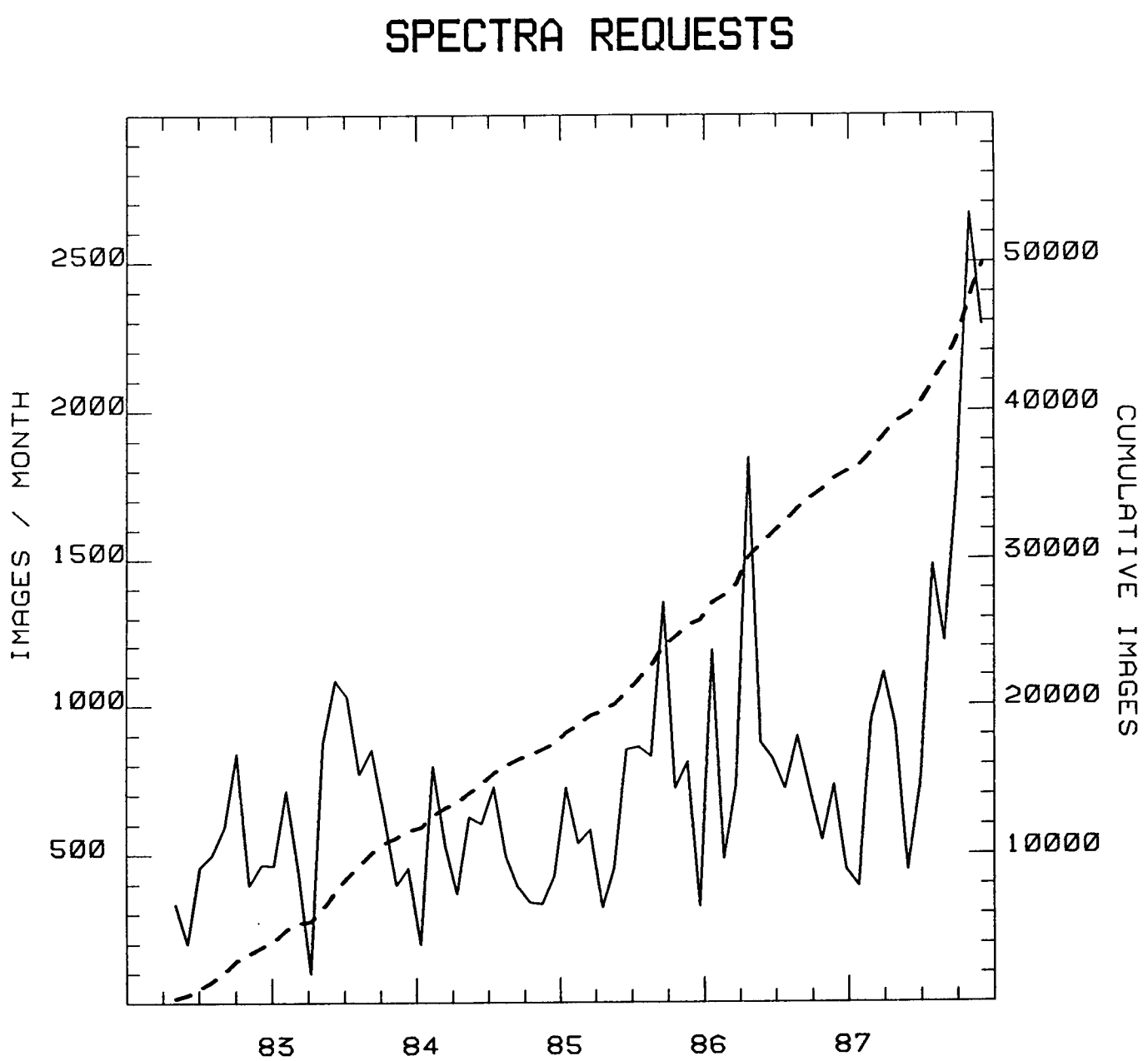


Figure 3. The number of IUE images retrieved (images retrieved per month - solid line and cumulative total - dashed line) from the NSESCC archive, since the inception of the facility in early 1982. Most of the retrieval has been processed-data requests. The requests have averaged 744 images per month, and as of November 1987, approximately 50,000 images have been retrieved.

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15. Supplementary Notes

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16. Abstract

The International Ultraviolet Explorer (IUE) Satellite has been in continuous operation since January 26, 1978. To date, approximately 65,000 spectra are in an archive at Goddard Space Flight Center in Greenbelt, MD. A number of procedures have been generated to facilitate access to the data in the IUE spectral archive. This document describes the procedures which include on-line quick look of the displays, search of an observation data base for selected observations, and several methods of ordering data.

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